

Potentiometric Surface Map of the Unconsolidated Aquifers of Decatur County, Indiana

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Decatur County, Indiana is located in the southeast portion of the state bounded by Bartholomew, Shelby, Rush, Franklin, Ripley, and Jennings Counties to the west, northwest, north, east, southeast and south, respectively. The majority of the county is situated within the East Fork White River Basin, while most of the eastern third is located in the Whitewater River Basin. Additionally a small portion of the county in the southeast is within the Ohio River Basin.

The Potentiometric Surface Map (PSM) of the unconsolidated aquifers of Decatur County was mapped by contouring the elevations of 313 static water-levels reported on well records received primarily over a 50 year period. These wells are completed in aquifers at various depths, and typically, under confined conditions (bounded by impermeable layers above and below the water bearing formation). However, some wells were completed under unconfined (not bounded by impermeable layers) settings. The mapped potentiometric surface contours are primarily for the upper 100 feet of the unconsolidated materials and utilize data for wells 100 feet or less in depth. If the shallow data was sparse or unavailable in an area, deeper wells were used to complement the mapping.

Additional areas of limited groundwater aquifer potential have been mapped using large diameter bucket wells. These unconsolidated deposits are typically very thin, generally less than 50 feet in thickness. About one-third of the unconsolidated wells in the county are large diameter bored (bucket wells) that produce from thin seams of coarse-grained material. Typically these wells are constructed at depths of 35 to 50 feet with either 30 or 36 inch diameter porous casing.

The potentiometric surface is a measure of the pressure on water in a water bearing formation. Water in an unconfined aquifer is at atmospheric pressure and will not rise in a well above the

top of the aquifer, in contrast to groundwater in a confined aquifer which is under hydrostatic pressure and will rise in a well above the top of the water bearing formation.

Static water-level measurements in individual wells used to construct county PSM's are indicative of the water-level at the time of well completion. The groundwater level within an aquifer constantly fluctuates in response to rainfall, evapotranspiration, groundwater movement and pumpage. Therefore, measured static water-levels in an area may differ due to local or seasonal variations. Because fluctuations in groundwater are typically small, static water-levels can be used to construct a generalized PSM. As a general rule, but certainly not always, groundwater flow approximates the overlying topography and intersects the land surface at major streams.

Universal Transverse Mercator (UTM) coordinates for the water wells were either physically obtained in the field, determined through address geocoding, or reported on water well records. The location of the majority of the water well records used to make the PSM were field verified. Elevation data were obtained from a digital elevation model. Quality control/quality assurance procedures were utilized to refine or remove data where errors were readily apparent.

Potentiometric surface elevations range from a high of 1050 feet mean sea level (msl) in the northeast portion of the county, to a low of 780 feet msl in the west-central portion of the county. Groundwater flow direction throughout the majority of the county is primarily to the west-southwest towards tributaries of the East Fork White River. In the eastern portion of the county flow is generally to the east-southeast towards tributaries of the Whitewater River and the Ohio River. Potentiometric surface elevations have not been extended through areas of the county that lack data and/or are covered by thin or unproductive deposits. These areas are mapped as no aquifer material or limited data zones.

The county PSM can be used to define the regional groundwater flow path and to identify significant areas of groundwater recharge and discharge. County PSM's represent overall regional characteristics and are not intended to be a substitute for site-specific studies.